

FEATURES

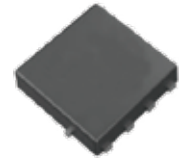
| Advanced trench cell design

| Low Thermal Resistance

APPLICATION

| Motor drivers

| DC - DC Converter



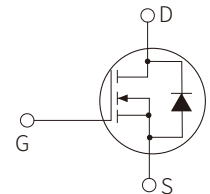
PDFN5×6-8L



Marking

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003



Schematic Symbol

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage $T_c=25^{\circ}\text{C}$		V_{DS}	40	V
Drain Current (Pulsed) $T_c=25^{\circ}\text{C}$ $V_{GS}=10\text{V}$		I_{DM}^{**}	380	A
Drain Current (DC)	$T_c=25^{\circ}\text{C}$ $V_{GS}=10\text{V}$	I_D	99	A
	$T_c=100^{\circ}\text{C}$ $V_{GS}=10\text{V}$		62	A
Gate-Source Voltage $T_c=25^{\circ}\text{C}$		V_{GS}	± 20	V
Total Power Dissipation $T_c=25^{\circ}\text{C}$		P_{tot}	46	W
Diode Forward Current $T_c=25^{\circ}\text{C}$		I_S	99	A
Junction Temperature		T_J	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$
Single Pulsed Avalanche Energy $V_{DD}=40\text{ V}$, $L=1.0\text{mH}$		E_{AS}	312	mJ
Thermal Resistance – Junction to Ambient		$R_{\theta JA}^{*}$	52	$^{\circ}\text{C/W}$
Thermal Resistance- Junction to Case		$R_{\theta JC}$	2.7	$^{\circ}\text{C/W}$

Notes:

* Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$

** Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

*** Limited by bonding wire

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_{DS}=250\mu A$	40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2		4	V
Drain Leakage Current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V$			1	μA
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
On-State Resistance	$R_{DS(on)}^a$	$V_{GS}=10V, I_{DS}=20A$		2.4	3.0	m Ω
		$V_{GS}=6V, I_{DS}=10A$		5.0	6.5	m Ω
Diode Characteristics						
Diode Forward Voltage	V_{SD}^a	$I_{SD}=20A, V_{GS}=0V$			1.3	V
Reverse Recovery Time	t_{rr}	$I_{DS}=20A, V_{GS}=0V$ $dI_{SD}/dt=100A/\mu s$		44		nS
Reverse Recovery Charge	Q_{rr}			28		nC
Diode Characteristics ^b						
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=20V,$ Frequency = 1 MHz		2028		pF
Output capacitance	C_{oss}			1001		pF
Reverse transfer capacitance	C_{rss}			94		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=20V, V_{GEN}=10V$ $R_G=3.9\Omega, R_L=1\Omega,$ $I_{DS}=20A$		11		nS
Turn-on Rise Time	t_r			45		nS
Turn-Off Delay Time	$t_{d(off)}$			27		nS
Turn-Off Fall Time	t_f			20		nS
Gate Charge Characteristics ^b						
Total Gate Charge	Q_g	$V_{DS}=20V, V_{GS}=10V, I_{DS}=20A$		38		nC
Gate-Source Charge	Q_{gs}			11		nC
Gate-Drain Charge	Q_{gd}			9.7		nC

Notes:

a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

b : Guaranteed by design, not subject to production testing

PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

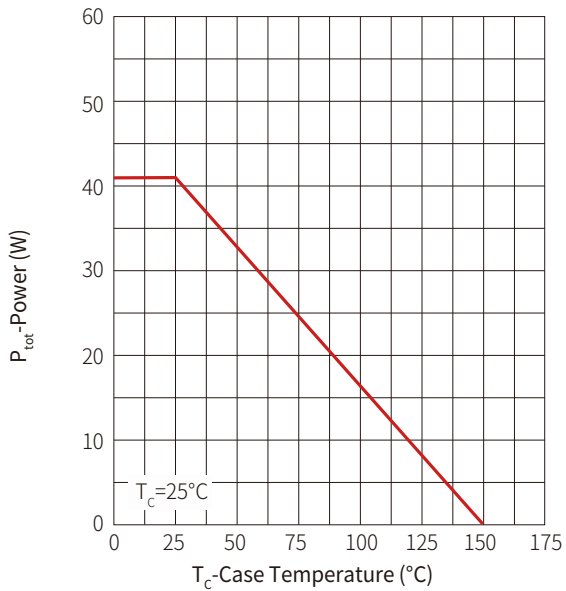


Figure2: Current Capability

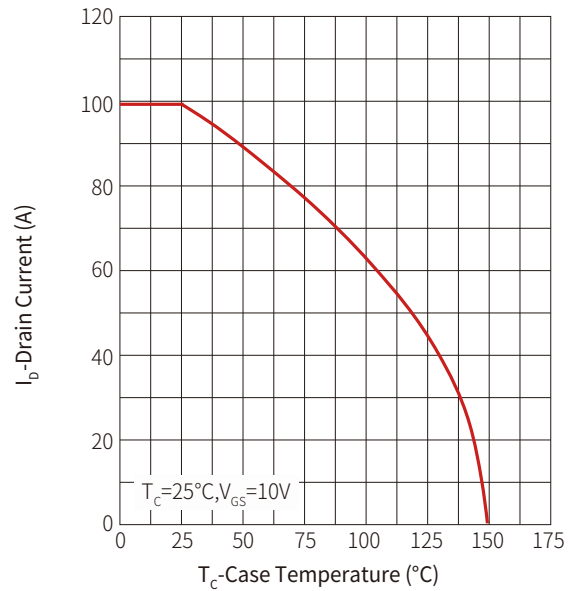


Figure3: Safe Operating Area

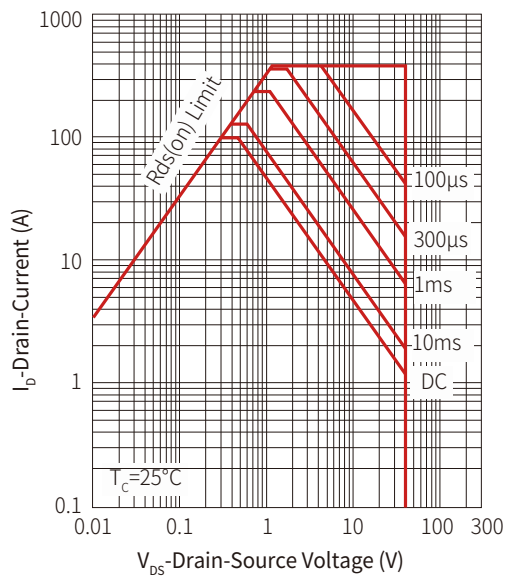


Figure 4: Transient Thermal Impedance

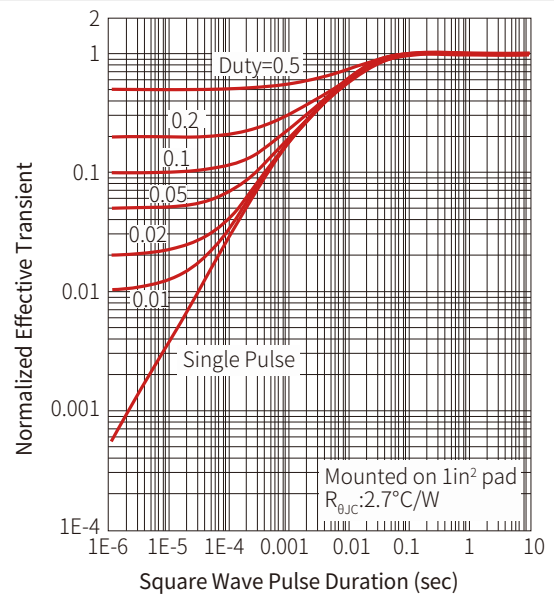


Figure 5: Output Characteristics

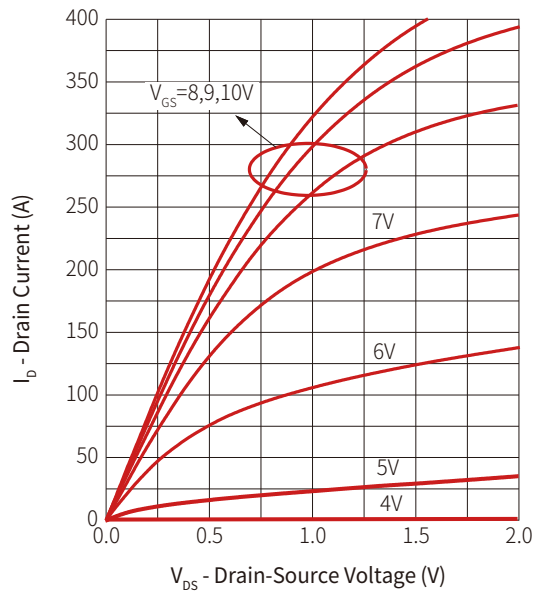


Figure 6: On Resistance

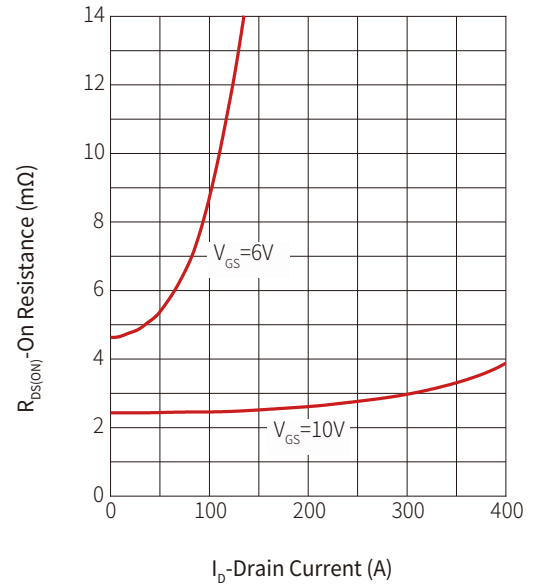


Figure 7: Transfer Characteristics

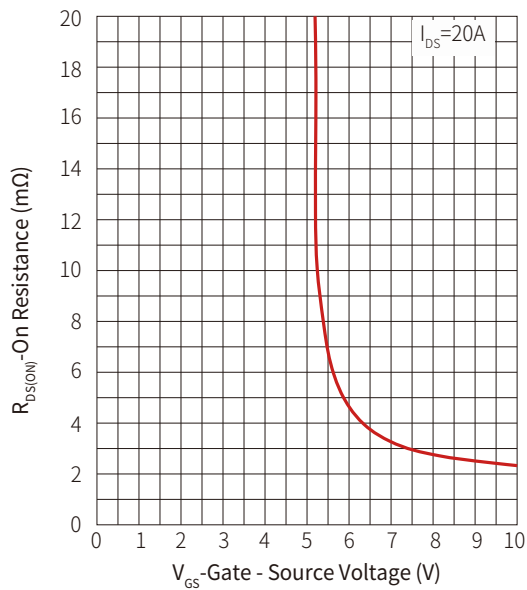


Figure 8: Normalized Threshold Voltage

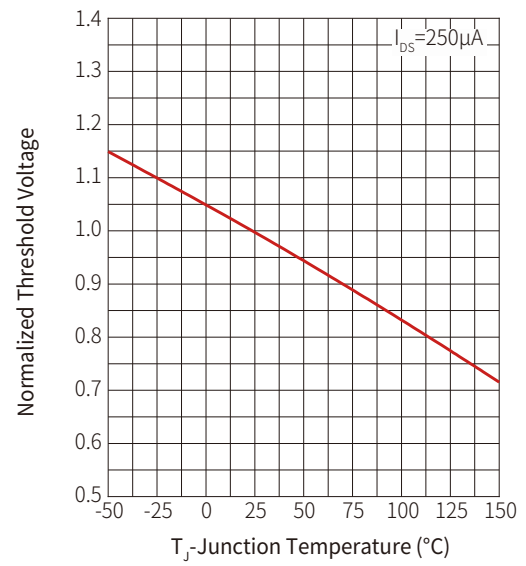


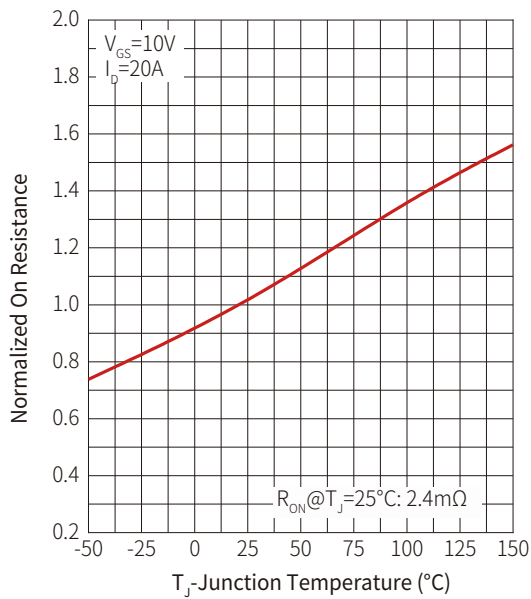
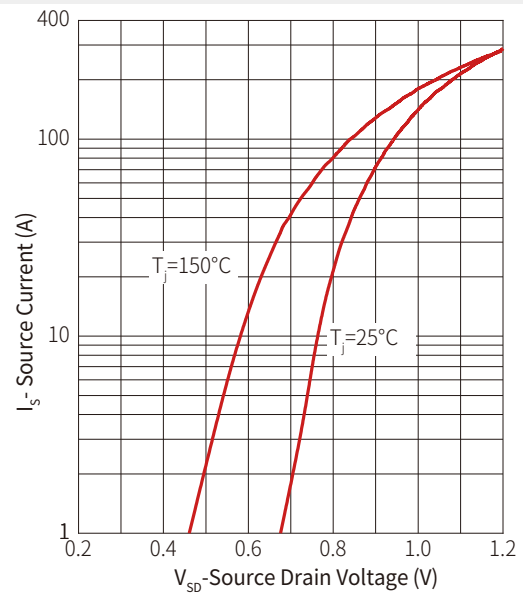
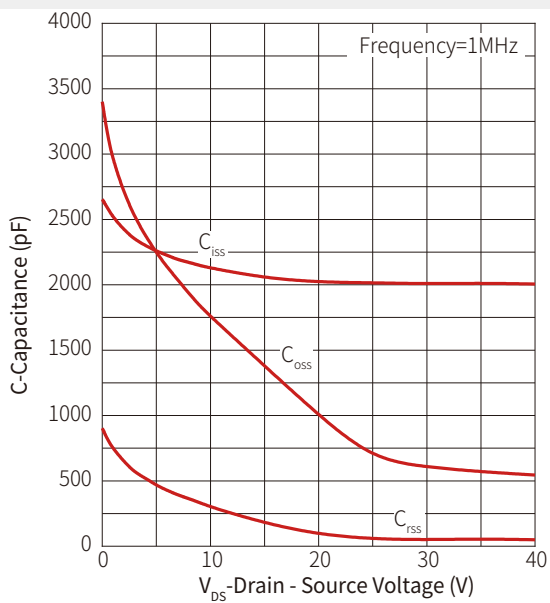
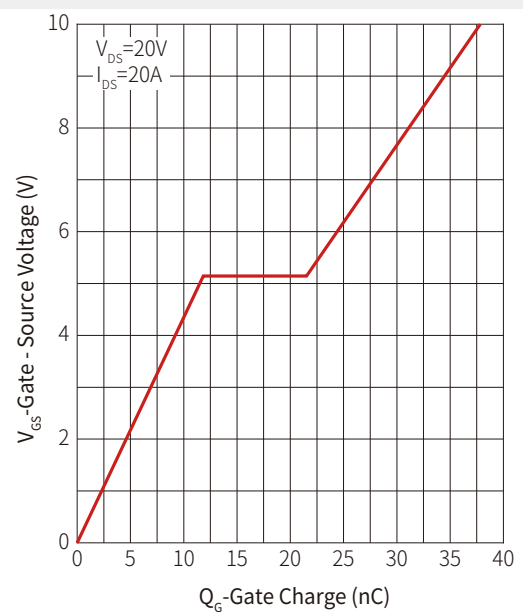
Figure 9: Normalized On Resistance

Figure 10: Diode Forward Current

Figure 11: Capacitance

Figure 12: Gate Charge


Figure 1: Mechanical drawing of the package. The drawing includes a top view showing dimensions D1, E1, and a central pin with dimensions PIN#1 I.D., Ø0.80, and DP:0.08 MAX. A side view shows the package height M. A cross-section view shows the package profile with dimensions b1, e, 4XL, and 4XM. A detailed view of the exposed die attached pad shows dimensions b1, b2, 8x, and 4XL. A detail view of the terminal tip shows dimensions L, b1, e, and 0.08. A detail view of the package profile shows dimensions A, A1, A3, and P. The drawing also includes various callouts for material and finish, such as 'bbaa C A B', 'ddd C C', 'ccc C', and 'leed C'.

Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.17	0.035	0.046
A1	0.00	0.05	0.000	0.002
A3	0.254REF		0.010REF	
b	0.31	0.51	0.012	0.020
b1	0.03	0.13	0.001	0.005
b2	0.21	0.41	0.008	0.016
D	5.15BSC		0.203BSC	
D1	5.00BSC		0.197BSC	
D2	3.70	3.90	0.146	0.154
E	6.15BSC		0.242BSC	
E1	6.00BSC		0.236BSC	
E2	3.56	3.76	0.140	0.148
e	1.27BSC		0.050BSC	
L	0.51	0.71	0.020	0.028
M	0.51	0.71	0.020	0.028
P	10°	12°	0.394°	0.472°
aaa	0.10		0.004	
bbb	0.10		0.004	
ccc	0.10		0.004	
ddd	0.05		0.002	
eee	0.08		0.003	

Part Number	Component Package	QTY/Reel	Reel Size
SNM3R0N04GH	PDFN5×6-8L	5000PCS	13"

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